

We Claim:

Claims

1. A filter element comprising a composite homogenous structure of inorganic  
5 fibres and reactant.
2. A filter element as claimed in claim 1, wherein the filter element is a structure  
which has been formed by a process of injection-moulding.
3. A filter element as claimed in claim 1 or 2, wherein the inorganic fibres are  
selected from the group ceramic fibres, crystalline mineral fibres, amorphous  
10 mineral fibres, mineral wood, glass fibres and fibres with refractory properties.
4. A filter element as claimed in claim 1 or 2, wherein the inorganic fibres  
include ceramic fibres selected from the group alumina, alumina-silicate,  
calcium silicate and silicates.
5. A filter element as claimed in any one of the preceding claims, wherein the  
15 reactant comprises activated carbon and/or a catalyst.
6. A filter element as claimed in claim 5, wherein the activated carbon is in the  
form of a powder and/or fibre.
7. A filter element as claimed in claim 5, wherein the catalyst comprises at least  
one precious metal and/or precious metal oxide.
- 20 8. A filter element as claimed in claim 5, wherein the catalyst comprises at least  
one precious metal supported on metal oxide particles.
9. A filter element as claimed in claim 7 or 8, wherein the precious metal and/or  
oxide thereof comprises 0.1 to 1% of the mass of the reactant.

10. A filter element as claimed in claim 7, 8, or 9, wherein the precious metal and/or precious metal oxide is at least one of the group platinum, palladium, ruthenium, aluminium, titanium, tungsten, and vanadium.
- 5 11. A filter element as claimed in any one of the preceding claims, comprising a binder system.
12. A filter element as claimed in claim 11, wherein the binder system comprises colloidal dispersion and at least one cationically modified starch or a flocculant.
- 10 13. A filter element as claimed in claim 12, wherein the colloidal dispersion contains at least one from the group silica, alumina, titanium dioxide, zinc oxide or zirconium oxide.
14. A filter element as claimed in claim 12 or 13, wherein the flocculant is selected from the group poly acrylamide, anionic or cationic organics or inorganic complexes.
- 15 15. A filter element as claimed in any one of the preceding claims, wherein the filter element is a hollow, candle shaped filter element, closed at one end.
16. A filter element as claimed in claim 15, wherein the reactant comprises 35 to 40% (by mass) of a 1 metre filter element weighing 750 to 800g.
17. A method of manufacture of a filter element comprising the steps of:
  - 20 (a) dispersing ceramic fibres in water;
  - (b) adding a binder system;
  - (c) mixing;

(d) injection-moulding to provide a filter element of the desired shape;  
and

(e) leaving the filter element to dry, wherein the method further includes the step of dispersing a reactant throughout the body of the filter element.

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18. A method according to claim 17, wherein the step of dispersing said reactant is by dispersing said reactant in said water.

19. A method according to claim 17 or 18, wherein said step of dispersing said reactant is by saturating said formed filter element in a reactant.

10 20. A method according to claim 19, wherein said saturating reactant is applied in the form of a dilute aqueous solution or a suspension.

21. A method according to claim 19 or 20, wherein said step of saturating is performed before said step of drying.

22. A method according to anyone of claim 17 to 21, wherein the reactant comprises activated carbon.

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23. A method according to anyone of claim 17 to 21, wherein the reactant comprises a catalyst.

24. A method according to anyone of claims 17 to 23, including the additional step of dipping said formed filter element into a dilute colloidal dispersion.

20 25. An apparatus for removing contaminants from waste gas, comprising at least one filter element formed from a homogenous structure of inorganic fibres and activated carbon, means to supply the waste gas to be filtered to the at least

one filter element, and means to supply hot nitrogen gas to the at least one filter element.

26. An apparatus as claimed in claim 25, comprising means to heat the nitrogen to at least 400°C.